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REMARKS

In the Office Action dated July 25, 2005, claims 1-24 are pending. Claims 1, 10, and 17 are independent claims from which all other claims depend therefrom. Claims 1, 12-17, and 20 are herein amended. Note that claims 1 and 17 are not amended for patentability reasons, but rather for clarification reasons and/or to further distinguish them over the relied upon art. Applicants submit that independent claims 1 and 17, like claim 10, are novel, nonobvious, and allowable and appealable as previously presented and are especially allowable as herein amended. Applicants also request that the amendments as herein provided be entered to place the case in a better position for appeal if necessary. The amendments herein provided do not raise new issues that would require further consideration.

The Office Action states that the drawings are objected to as failing to comply to 37 CFR 1.84(p)(5) because they do not include reference signs in the Figures for: the electron beam 40, step 100, step 102, step 104, step 106, and step 108. Corrected drawing sheets are again herewith submitted having amended Figures 2 and 3, which include the stated signs.

Claims 12-16 and 20 stand objected to for informality reasons. Claims 12-16 and 20 are herein amended as suggested in the Office Action to correct the minor draft errors and antecedent basis problems.

Claims 1-2, 4, 6, 7, and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (U.S. Pat. No. 5,517,545) in view of Barrett (U.S. Pat. No. 6,674,838).

Amended claim 1 recites a sealed electron beam source for an imaging tube that includes a source housing with a non-apertured source window that forms a sealed structure with the source housing. The source window separates a source interior from an external cavity. The source electrode emits electrons through the source window to a target external to the source housing. The source window

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includes feedthroughs for a coolant to flow therein and absorb heat from the source window.

Nakamura discloses an x-ray tube 10 that includes a cathode 15b that emits electrons to impinge upon a target 16a to generate x-rays. The x-rays are directed through an x-ray tube window 14.

The Office Action states that Nakamura discloses an apparatus that has a source housing with a source window and a source electrode that emits electrons through the source window. The Office Action states that regardless of whether there is a hole or aperture, a window is shown since a window can have a hole or aperture. Applicants submit that regardless of whether this is true, claim 1 as previously presented referred to a non-apertured window. Applicants submit that in order for a sealed electron beam source to be provided as previously and as currently claimed that the recited window clearly does not have a hole or aperture. Although this was implicitly claimed previously, this is now explicitly clarified by the amendment. Thus, Nakamura fails to disclose, teach, or suggest the stated limitation.

The Office Action states that Nakamura fails to disclose a source window forming a sealed structure with a source housing and wherein said source window comprises feedthroughs for a coolant to flow therein and absorb heat from the source window. Applicants agree. However, the Office Action states that Barrett provides such disclosure. Applicants, respectfully, traverse.

Barrett discloses an x-ray tube 10 having a cathode assembly 52 and an anode assembly 108 that is external and separate therefrom. The cathode assembly 52 includes a filament 56 that is attached to a support structure 56A. Electrons are emitted from the filament 56 through an aperture 60 to impinge upon a rotating target 112 on an anode 106 of the anode assembly 108.

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The Office Action states that Barrett discloses a source window 58. Applicants submit that item 58 is not a source window, but rather is an aperture shield that has the aperture 60 therethrough. Also, clearly the aperture 60 is not a non-apertured source window as claimed.

The Office Action then states that item 58 forms a sealed structure with a source housing and refers to col. 5, lines 62-67 for such reliance. Applicants submit that in col. 5, lines 62-67 Barrett states that a seal is formed between the aperture shield 58 and the support structure 56A. Coupling or forming a seal between two items does not necessarily mean that the two items are sealed or that the two items together form a sealed structure that separates an interior cavity and an external cavity. In Barrett a seal is merely used between two parts, the parts do not form a seal between two cavities. In close review of Figure 1 of Barrett one can see that the internal cavity of the cathode assembly 52 is not sealed from the cavity in which the anode assembly is disposed. This is primarily due to the aperture 60, which provides an open passage between the cavities. Besides, Applicants submit that an item that has an aperture cannot form a sealed structure. A sealed structure is one without openings, that is closed, and is one that does not allow fluids, such as liquids or gases, to pass therethrough. Claim 1 does not recite that a seal is coupled between the source housing and the source window, but rather states that the source window forms a sealed structure with the source housing.

In addition, since Barrett fails to disclose a non-apertured source window that forms a sealed structure with a source housing, Barrett also fails to disclose such a window having feedthroughs as claimed.

Referring to MPEP 706.02(j) and 2143, to establish a *prima facie* case of obviousness the prior art reference(s) must teach or suggest all the claim limitations. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Thus, Applicants submit that Nakamura and Barrett alone or in combination fail to teach or suggest each and every limitation of claim 1, therefore, claim 1 is novel, nonobvious, and is in a condition for allowance. Since claims 2, 4, 6, 7, and 9 depend from claim 1, they

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too are also novel, nonobvious, and are in a condition for allowance for at least the same reasons.

The Office Action states that with respect to claim 7, that limitations from the specification ought not to be read into the claims. Applicants agree. Regardless, of whether limitations from the specification are read into the claims, Nakamura fails to teach or suggest a source electrode with variable potential. No matter how the term "variable potential" is defined, clearly "variable potential" does not mean the ability to simply turn a device on and off. The term variable denotes that it is subject to change, that it has multiple possible potentials, or that it has a potential that varies within a given range, see *Webster's Third New International Dictionary* and elsewhere. This is not taught or suggested by Nakamura. This limitation is also not taught or suggested by Barrett. Thus, claim 7 is further novel and nonobvious for the above-stated reasons.

Claim 5 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. and Barrett as applied to claim 1 and further in view of Beland (U.S. Pat. No. 5,241,260). Claims 8 and 22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. and Barrett as applied to claim 1 above, and further in view of Matsushita et al. (U.S. Pat. 6,526,122).

Applicants submit that since claims 5, 8, and 22 depend from allowable claim 1, that they are in a condition for allowance for at least the same reasons.

Claims 10, 12, and 15-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Barrett in view of Yamaguchi (JP 54-151384).

Claim 10 recites an imaging tube that includes a rotating target with a third voltage potential and decelerating electrons to generate x-rays. A sealed electron beam source is external and separate from the target and separates a source interior from a low-pressure cavity, which contains the rotating target. The sealed electron beam source includes a source housing. The source housing has a source window with a first voltage potential, that is approximately equal to the third voltage

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potential, and a source electrode. The source electrode has a second voltage potential and generates and emits electrons through the source window to the target.

The Office Action states that Barrett discloses a sealed electron beam source and refers to item 50. Applicants submit that item 50 is a cathode portion that, as shown above, is clearly not sealed from the cavity surrounding the anode assembly 108. This is evident by the aperture 60. The Office Action also states that item 50 is external and separate from a target and separates a source interior 64 from a low-pressure cavity containing the target. Applicants submit that item 64 is not a source interior, but rather refers to cooling surfaces on the exterior of the aperture shield 58. The cathode portion 50 of Barrett does not separate the cathode assembly 52 from the cavity surrounding the anode assembly, due to the aperture 60 therebetween. The cathode portion 50 merely refers to a portion of the imaging tube 10 that contains the filament 56.

The Office Action then states that Barrett fails to disclose a window having a voltage potential that is approximately equal to a voltage potential of a target. Applicants agree. However, the Office Action states that Yamaguchi provides such disclosure. Applicants traverse.

The Office Action states that Yamaguchi discloses a window 21 having a voltage potential that is approximately equal to a voltage potential of a target. Applicants submit that item 21 is not a window, but rather is a hood that has a hole 25 for reception of a beam therethrough. The hood 21 encloses a rotating anode not a cathode or source electrode. The hood 21 is not a source housing. The Yamaguchi, like Barrett, also fails to disclose a source housing as claimed.

Thus, claim 10 is novel, nonobvious, and is in a condition for allowance for the above stated reasons. Also, since claims 12 and 15-16 depend from claim 10, they too are novel, nonobvious, and are in a condition for allowance for at least the same reasons.

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Claims 13-14 stand rejected under 35 U.S.C. 103(A) as being unpatentable over Barrett and Yamaguchi as applied to claim 10 and further in view of Matsushita.

Applicants submit that since claims 13-14 depend from allowable claim 10, that they too are novel, nonobvious, and are in a condition for allowance.

As stated above Barrett and Yamaguchi fail to disclose several limitations of claim 1.

The Office states that Barrett does not disclose a frame coupled within a tube, a low-pressure cavity fluidically coupled between the frame and a target, the cavity at least partially defined by the frame, the target, and a sealed electron beam source, and the cavity at least partially exhausted or filled with a low-pressure gas including at least one of a low-Z substance, helium, nitrogen, or argon. Applicants agree. However, the Office Action states that Matsushita provides such disclosure. Applicants traverse.

Matsushita, like Barrett and Yamaguchi, fail to provide a sealed electron beam source. The electron gun 50 of Matsushita has an openings 25a, 71a, and 72a, like the aperture 60 of Barrett and the hole 25 of Yamaguchi. The cavity around the target 32 of Matsushita is open to the cavity around the cathode 73. Thus, Matsushita fails to teach or suggest a low-pressure cavity defined by a sealed electron beam source or the same exhausted or filled with a low-pressure gas. Matsushita also fails to teach or suggest a source window that has a voltage potential that is the same as a rotating target. Thus, claims 13-14 are further novel and nonobvious for above-stated reasons.

Claims 17-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Barrett in view of Yamamura (U.S. Pat. No. 4,188,558).

With respect to claim 17, the Office Action states that Barrett discloses sealing the source housing and again refers to col. 5, lines 62-67 of Barrett. Applicants have shown above that the seal mentioned in col. 5, lines 62-67 of Barrett is disposed between the aperture shield 58 and the support structure 56A and does refer to or

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form a sealed source housing. Yamamura also fails to teach or suggest a sealed source housing. The cathode 6 and the anode 5 are contained within an envelope 5. There is not a separate sealed source housing for the cathode 6 with respect to the anode 5.

The Office Action states that Barrett fails to disclose a cavity containing a source and a target and partially filled with a gas. Applicants agree. However, the Office Action states that Yamamura provides such disclosure. Applicants traverse.

Yamamura, as stated, discloses an envelope 5 containing a cathode 6 and an anode 7. The cathode 6 does not have a sealed source housing that is separate from the anode. Thus, Yamamura, like Barrett, fails to teach or suggest a cavity having a sealed source housing and an anode.

Claim 17 now recites the limitation of sealing a source housing from an external low-pressure cavity that has a target. This limitation was previously implied by the limitations of the sealing of a source housing, the forming of a low-pressure cavity containing the source housing and the target, and the directing of electrons through a source window at the target and especially in view of the specification of the present application. Neither Barrett nor Yamamura teach or suggest this limitation. Barrett discloses the aperture 60 as proof that the cathode portion 50 is not sealed relative to the anode assembly 108. Yamamura discloses a cathode 6 and an anode 7 that are both disposed with the same envelope 5.

Thus, claim 17 is also novel, nonobvious, and is in a condition for allowance. Also, since claims 18-20 depend from claim 17, they too are novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Claim 21 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura and Barrett as applied to claim 1 and further in view of Yamaguchi.

Applicants submit that since claim 21 depends from allowable claim 1, that it too is novel, nonobvious, and is in a condition for allowance for at least the same reasons.

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Applicants also submit that none of the references teach or suggest a source window that has the same voltage potential as a target. As stated above, Yamaguchi discloses a hood 21 that has the same voltage potential as the target 17. The hood is not a window and is clearly not a source window. The hood 21 is part of the anode assembly and partially encases the target 17. The hood 21 is not part of the source assembly 12. The beam source of Yamaguchi does not have a separate housing and does not include a window that is at the same potential as the target 17. Therefore, claim 21 is further novel and nonobvious for the above-stated reasons.

Claim 23 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Barrett and Yamaguchi as applied to claim 10 and further in view of Koller (U.S. Pat. No. 6,438,208). Claim 24 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Barrett, Yamaguchi, and Koller and further in view of Richardson (U.S. Pat. No. 6,529,579).

Applicants submit that since claims 23-24 depend from allowable claim 10, that they too are novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Claim 24 recites the limitations of the source window having feedthroughs, which are coupled to coolant channels within a coolant channel housing. Applicants submit that since none of the references teach or suggest a source window as claimed, that none of the references teach or suggest such a source window having feedthroughs as claimed. Koller and Richardson, like Barrett and Yamaguchi fail to disclose a source window of a sealed electron beam source. Koller and Richardson fail to disclose a source window of any kind. In Koller electrons are emitted from an electron source 106 within a cavity to impinge upon an anode 108. In Richardson electrons are also emitted through a single cavity and through a deflection device 110 to an anode 108. Notice that the x-ray windows 200 and 112 of Koller and Richardson are not source windows of a sealed electron beam source for which electrons pass as claimed, but rather are x-ray windows of an x-ray device for which x-rays pass. Thus, claims 23-24 are further novel and nonobvious for the above-stated reasons.

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Referring to MPEP 706.07, Applicants, respectfully, submit that this action has been improperly been made Final. Applicants agree that under present practice a second or subsequent action may be made Final. However, Applicants' amendment of May 18, 2005 did place the case in a condition for allowance even in view of the newly disclosed and relied upon art of the current Office Action. Applicants have herein only amended the claims to explicitly state that which was implicit or apparent from the recited limitations and especially in view of the specification. Applicants understand that limitations from the specification cannot be read into the claims. However, the claims ought to be construed in light of and in a consistent manner in view of the specification. To assert that a sealed electron beam source has an aperture or a window with a hole would not make sense and would also be inconsistent with the specification of the present invention. Also, the references clearly fail to teach or suggest each and every limitation of the claims as previously presented and especially as herein amended.

In addition, present practice does not sanction hasty or ill-considered final rejections. The Applicants have merely sought to define the patent protection to which they are justly entitled. The Applicants have previously and clearly amended the claims such that the claimed invention is not taught or suggested by the prior art, and in so doing they deserve the cooperation of the Examiner and should not be prematurely cut off in the prosecution. The Applicants have responded promptly and have not resorted to technical or obvious subterfuges. Although the claims have been and are in allowable form, should the Examiner deem a further search is necessary, the application should be made non-final and the issuance of an Advisory Action should be deemed inappropriate at this time.

In light of the amendments and remarks, Applicants submit that all of the objections and rejections are now overcome. The Applicants have added no new matter to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, the Examiner is respectfully requested to contact the undersigned attorney.

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The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account 50-0476.

Respectfully submitted,

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